prepared from the nitrate. The hydrogen was in each case prepared by electrolysis. The water produced was free from any acid reaction, and no trace of the oxides of nitrogen could be detected.

XIX. "On Muscle Plasma." By W. D. Halliburton, M.D., B.Sc., Assistant Professor of Physiology, University College, London. Communicated by Prof. E. A. Schäfer, F.R.S. (From the Physiological Laboratory, University College, London.) Received May 24, 1887.

The facts described by Kühne relating to the properties of the muscle plasma of cold-blooded animals are true in great measure for that of mammals.

Admixture of muscle plasma with solutions of neutral salts prevents the coagulation of the latter. Dilution of such salted muscle plasma brings about coagulation; this occurs most readily at 37—40° C. Saline extracts of rigid muscle differ from salted muscle plasma in being acid, but resemble it very closely in the way in which myosin can be made to separate from it; myosin in fact undergoes a recoagulation. This is not a simple precipitation; it is first a jellying through the liquid; the clot subsequently contracts, squeezing out a colourless fluid or salted muscle serum. This does not take place at 0° C.; it occurs most readily at the temperature of the body, and is hastened by the addition of a ferment prepared from muscle in the same way as Schmidt's ferment is prepared from blood. The ferment is not identical with fibrin ferment, as it does not hasten the coagulation of salted blood plasma; nor does the fibrin ferment hasten the coagulation of muscle plasma. The recoagulation of myosin is also accompanied by the formation of lactic acid.

The proteids of muscle plasma are—

1. Paramyosinogen, which is coagulated by heat at 47° C.
2. Myosinogen,* which is coagulated at 56° C.
3. Myoglobulin, which differs chiefly from serum globulin in its coagulation temperature (63° C.).
4. Albumin, which is apparently identical with serum albumin α, coagulating at 73° C.
5. Myo-albumose; this has the properties of deutero-albumose, and is identical with, or closely connected to, the myosin ferment.

The first two proteids in the above list go to form the clot of myosin; paramyosinogen is, however, not essential for coagulation; the three last remain in the muscle serum.

* It is on the presence of this proteid that the power of fresh muscle juice to hasten the coagulation of blood plasma depends.

Paramyosinogen, myosinogen, and myoglobulin are proteids of the globulin class. They are all completely precipitated by saturation with magnesium sulphate, or sodium chloride, or by dialysing out the salts from their solutions. They can be separated by fractional heat coagulation, or by fractional saturation with neutral salts.

When muscle turns acid, as it does during *rigor mortis*, the pepsin which it contains is enabled to act, and at a suitable temperature (35—40° C.) albumoses and peptones are formed by a process of self-digestion. It is possible that the passing off of *rigor mortis*, which is apparently due to the reconversion of myosin into myosinogen, may be the first stage in the self-digestion of muscle.

XX. "Dispersion Equivalents. Part I." By J. H. GLADSTONE, Ph.D., F.R.S. Received May 24, 1887.

The idea of refraction equivalents has become familiar to those who work on the borderland of optics and chemistry, and the value of that property as a means of investigating the chemical structure of compounds is becoming more and more recognised. There is a similar property, perhaps equally valuable for the same object, which has attracted little attention hitherto; I allude to the equivalent of dispersion. During the last twelve months, however, I have collated old measurements of the length of the spectrum, whether made by myself or by others, and have added many new determinations, and I am now in a position to submit some of the results to the Society.

The history of the subject goes back to the first paper of Mr. Dale and myself upon the refraction of light,* in which we gave as one of the conclusions "the length of the spectrum varies as the temperature increases." In our second paper† we came to the conclusion that "there is no simple relation holding good for different liquids between the increase of volume and the decrease of dispersion by heat," contrary to what we found to be the case with refraction. We adopted $\mu_H - \mu_A$, *i.e.*, the difference between the refractive indices for the solar lines A and H as the measure of dispersion. This divided by the density gave the specific dispersion. When, however, Landolt adopted the plan of calculating the "refraction equivalent," we applied the same method to what we termed the dispersion equivalent, that is, "the difference between $P\frac{\mu_A - 1}{d}$ and $P\frac{\mu_H - 1}{d}$, or more simply

* "On the Influence of Temperature on the Refraction of Light." 'Phil. Trans.,' 1858, p. 8.

† "On the Refraction, Dispersion, and Sensitiveness of Liquids." 'Phil. Trans.,' 1863, p. 323.